24 November 1959

MEMORANDUM FOR THE RECORD

SUBJECT: WS 117-L Special Studies Committee Meeting, DC, 11 November 1959, LMSD, Sunnyvale, California

1. On 10 and 11 November 1959, [redacted] attended, as alternates for Mr. A. C. Lundahl, the regular meeting of the WS 117-L Special Studies Committee. The conference was held in Building 104 of the Lockheed Sunnyvale facility.

50X1
50X1

2. A complete list of those present is not available at present, but will be forthcoming with the official minutes of the meeting at a later date.

The following persons were present, however:

Robert H. Shatz, Chairman
Dr. Bruce Billings
Amrom Katz
Jesse Greenstein
Dr. C. B. Tompkins
Harry H. Goode
David A. Kahn
Dr. John H. Roscoe, LMSD
Francis M. Kelly, RADC
Major H. F. Weinberg, BMD
[redacted]

50X1

3. On 10 November the Ferrett System (SS-F) was discussed, and on 11 November the Photo System (SS-E). (SS-G, the IR System was only mentioned briefly).

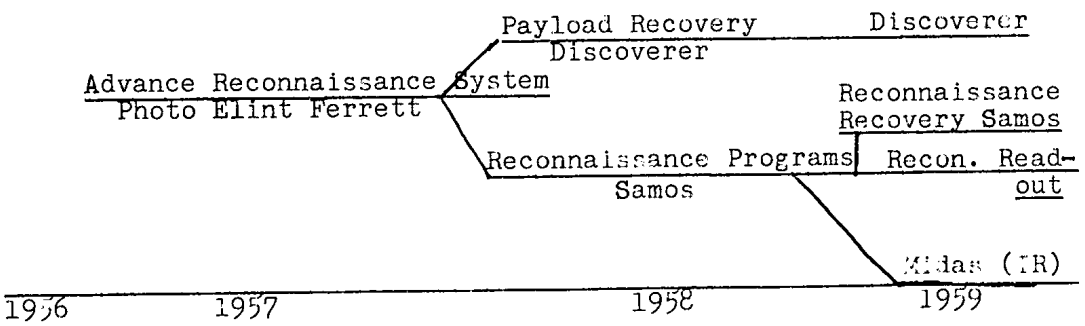
Sub-contractors to LMSD on SS-F are:

Airborne Instrument Laboratory (AIL), Mineola, N. Y.
Haller, Raymond, and Brown, State College, Penna.

Three recent Engineering Evaluation Reports were mentioned:

No. 60163 - Vol I - F-1 System
Vol II - F-2 System
Vol III - Intelligence Report

4. W. V. Tyminski - LMSD - Major Program Reorientation



SECRET

Phillip D. Doersam - LMSD - SS-F
Schedule -
Apr. 60 - F1-E1 (Will slip to June) (12 day life, 6 days each system)
Jun. 60 - F1-E1
Aug. 60 - F2-E1
Nov. 60 - F2
Feb. 61 - F-3a
May 61 - F-3b
Jul 61 - F-3c

F1 - Early Development Test System
F2 - EOB - General Coverage System
F3 - Technical Intelligence - Specific Mission Systems
Wide Band Analog Record
Improved Location Accuracy
Accuracy in Signal Parameters and steerable antennae
(Spec. pulsed and CW emitters)
F3a - [redacted] 50X1
100 KC BW Analog recorder
F3b - Will handle unconventional emitters and technical intelligence
F4 - Advanced Ferrett System

Proposed Samos SS-F Flight (Basically Engineering Program) Schedule
60 Jun, Jul, Aug - 3-F1 (Dual F1-E1) Atlas
Dec 1-F2
61 Feb, Jun, Oct - 3-F2 (Operational date F2-Dec'61)
62 Jan, Mar, May, Jul - 4-F3 (Operational date F3-Sept'62)
(Operational dates - where intelligence takes precedence over R and D)

Dr. W. M. Harris - LMSD - Intelligence Planning
LMSD does not produce intelligence from this data
[redacted] 50X1

W. Burnett - HRB - Intelligence Analysis
Relation of intercepted signals to intelligence objectives
The levels of intelligence information which have been identified -
1 - Density of signals
2 - Types of radiators, EW, GCI
3 - Classes of radiators
4 - Numbers of radiators in classes
5 - Associated array radiators
6 - Associated w/known radiator technique - technical intelligence

SECRET

7 - Associated with geographic areas
8 - Identify and keeping track of groups of radiators
9 - Identify and keeping track of individual radiators
10 - Changes in characteristics of individual radiators
11 - Extraction of semantic content from signals

Test controller console - DCC (LMSD - Sunnyvale)
TV writing unit - write on screen w/camera underneath
4 TV screens in console - distaphone - (for controlling satellites in orbit) common terminals
Console must display - simultaneously
Mission assignments
Schedules
Weather
Times
System readiness
Satellite positions
Countdown progress
Recovery situation

TV monitored data (Dynamic)
Teletype traffic (26 cameras in system)
Remote Station Status
Satellite equipment status
Communication link status
Count down check list
Weather
Schedules

DCC-Development Control Center-Prototype
TOCC-Technical Operation Control Center-Ultimate

TV Data Board
Write on or lay material on, w/TV camera mounted beneath.

Iconorama-
for presenting dynamic data-
Slide projected on which can draw or write on slide as it is being projected
Can also call for reference maps, other statistical data for presentation on screen.

W. E. Fromm - AIL - F Advanced Program
Cost of Samos this year is almost one dollar per head in U.S. (180 megabucks)
(F^4 - 1 1/2 yr. study and system design, 1 1/2 yr. test and evaluation)
(Almost four years required to produce the item)

SECRET

Sid Hasin - RW - Subsystem I
(1) Operation, procedures and equipment for processing of digital data from F2 system
F1-F2-F3 - 150 mi. diameter circle of coverage on ground.
SS/I - ELINT

[redacted] 50X1

Feedforward
1 day - 1 week - Detailed reports (EOB)

AN/FSQ-27 data processor for Ferrett

Dr. F. Kameny - RW - Advanced Ferrett data reduction procedures
15,000 intercepts/day - Individual and separate
2 vehicles predicated on Intelligence or maximum capability
Is 150 miles the coverage or ground resolution
Katz raised a question about utility of the end product of F systems vs. requirement, if any. Some heated discussion of this point.

11 November 1959

M. E. Stickney - LMSD - E1, E2, E3, E5

	Gd. Cov.	GD. Res.	F
E1 -	100 mi.	100 ft.	6"
E2 -	17 mi.	20 ft.	36"
E3 -	5x5 mi.	5 ft.	
E5 -	60 mi.	5 ft. - (Steerable and recoverable)	

E1 - not an operational package, R and D only.
E4 - discontinued as AF package, now the "A" program.
E2 - Eastman Kodak Development

20 ft. resolution	36" Focal length
17 mi. width coverage	70 mm wide film
26 degrees obliquity max.	format 2" wide
34 degree convergent angle	resolution-250 1/mm
10 lb/mo. film consumption	F/4
55,000 m sq/day cov.	9" aperture
4 mo. life	

6 megacycle band width transmission
Film velocity - 1/2"/sec. nominal
Stereo capability by back and forth pointing. 1/100 sec. nominal exposure.

SECRET

SECRET

Dr. Lee - Radiation

Primary cosmic - energetic, 90% protons - in BEV range up to 10^{19} EV flux - 1 or 2 CM^2/sec. - 1 milli Roentgen/hr.
Van Allen - inner and outer belts - electrons + few protons - flux - 100R/hr. electrons, <1-200KV
Auroral - ?
Winkler - proton radiation
EK film - S.O. 243 has 100 Roentgen tolerance w/o noticeable degradation
γ radiation - though fast does less damage than slow radiation (α and B)
Analogy - dog running through forest does less damage than one which lingers
Inner Van Allen belt - narrow in latitude about the magnetic equator
Outer - 3 1/2 earth's radii away - electrons
<800 KV - flux to 1000x10^4R/hr. - soft - requires little shielding.
Auroral - important to photography -
Ratio between flux levels, active vs. quiet - 1000:1
10^5 or 10^6/R/hr. 20-30KV
Energy - 10,000 KM/sec. = 10 KEV
Only a few EV needed to sensitize silver halide grains in film emulsion.

[redacted]

50X1

SECRET

E2 - Flight schedule
MK1 - Nov. 60, Jan., 61
MK2 - May, Aug., Oct., Dec., 61
Changeable focus-from ground
S.O. 243 film
E3 (EK) Advanced photo readout
Alt. 300 _ 40 mi.
Ground resolution - 5' (2.5' w/2X power changer)
Contrast - 2:1
Life - 4-12 mo.
Pay load weight - 2000 lb.
Pay load diameter - 5-6'

System resolution - 100 l/mm (system, w/readout 87 lines/mm
Focal length - 120" F/4.5 or 144" (Still in doubt)
Film S.O. 243 or 213
Width - 5"
Filter - Wratten 12
Nominal exp. - 1/130 sec. at T5.6
Solar power supply

E5 (ITEK development) - recoverable (160 m. alt.
115 l/mm system resolution
30x30 mi. coverage w/5' resolution, 72" focal length
60x60 mi. coverage w/10' resolution
Stereo capability
5"x25" format - panoramic (20 degrees scan angle)
Horizon scanner for attitude determination
One n.m. position accuracy

Film - 1 mo. operation
400 lb. film (20,000 ft. approx.)
Scheduled - Aug-Oct 1961
Pressurized and temperature controlled
1/10 degree determination of attitude

<u>All Electronic E-3 Recon. System</u> - Uses Electrostatic Tape Camera
Not affected by radiation - Auroral or Van Allen
One millisecond exposure - reduces IMC and stability requirements.
Can re-use sensing and storage mediums
Operates at very low light levels by use of image intensification
RCA, Princeton - Model electrostatic tape camera working.

SECRET